István Posgay – Gábor Regős – Diána Horváth – Dániel Molnár

Chapters from Economic Theories on Hysteresis

Summary: Since the economic and financial crisis of 2008, proposals on economic policy devised on the basis of hysteresis have become the focus of economic sciences. This study presents some theories on the 2008 crisis and subsequent hysteresis, as well as related economic policy proposals. The crisis and hysteresis acted as theoretical catalysts and, by expanding the boundaries of previous main theories, sometimes produced significant results, and continue to do so to this very day. Hysteresis is also significant from the point of view of the Hungarian economy, as the crisis has hit the country particularly hard. However, as a result of the post-2010 economic policy shift, the government has been able to rebalance and put the economy back on a growth path. This can also be called a positive hysteresis, as the economy is growing steadily and faster than expected based on this trend.[1]

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The economic and financial crisis of 2008 and the slow recovery that followed have surprised not only economic actors but also a significant number of theoreticians and economic scientists.

The crisis and hysteresis acted as theoretical catalysts and, by expanding the boundaries of previous theories, sometimes produced significant results, and continue to do so to this very day. The presentation of some of these results is the subject of our study below. We are presenting theories that have attempted to move further towards theoretical renewal, leaving behind them, or even amend some of the unquestioned dogmas of dominant neoclassical theory. Our focus is on presenting the, if you like, unorthodox nature of the theories discussed. The well-executed implementation of the latter, even if had discussed just a few theories, goes far beyond the scope of a journal article, both in extent and depth. Similarly, detailed testing on empirical data would exceed the scope of the journal.

In the present study, we will first introduce the concept of hysteresis and its extent. We then discuss theories in selected areas, such as technology developments, financial crises, the relationship between cycle and trend, and fiscal multipliers.

E-mail address: posgay@szazadveg.hu; regos@szazadveg.hu; horvath.dia@szazadveg.hu; molnar.daniel@szazadveg.hu

THE CONCEPT AND SIGNIFICANCE OF HYSTERESIS

The concept of hysteresis (Blanchard and Summers, 1986) first emerged in the last century[2] and became more widespread in the context of the 2008 crisis. More generally, it refers to a post-crisis slowdown relative to the expected trend-based growth.

The significant change in the perception of hysteresis can be illustrated by comparing statements made by one who gave a name to the phenomenon, *Blanchard*, before the outbreak of the crisis *('macroeconomic conditions are good…'[3])* with the enormous efforts made by him and others after the crisis to understand the phenomenon (see e.g.: Blanchard and Summers, 2015).

Hysteresis triggered some sort of fermentation in economic thinking in the context of which some former dominant theoretical tendencies were put under considerable fire. There are those who interpret the occurrence of the crisis, the economic policy responses given to it, and the resulting challenges of economic growth, as a result of the failure of economic theoretical thinking.

Stiglitz (2012, 2014) clearly attributes the crisis to human factors, which he said were far from being inevitable. In his opinion, the policies of the US monetary and financial regulators have led to a crisis in the US and Europe, but the responsibility of economists and their models is also significant. Not only were the standard models unable to predict the crisis, but based on these models, such a crisis could not have happened, so they were not able to provide a way out for the economic policy. Following the bursting of the bubble, it has been shown that the crisis will be contained, requiring no significant change in economic policy patterns or macroeconomic paradigms (Blanchard et al., 2010). According to Stiglitz, one of the major shortcomings of the models was their inability to propose an adequate prototype for the credit market, although this was not the first time in economic history that the credit boom had led to a major downturn (see as first example to this speculative bubble the 'Tulip Mania' of 1637).

Stiglitz, referring to his earlier work (Stiglitz, 1982 in Stiglitz, 2014: 5), noted that asymmetric knowledge, even under the rational expectation hypothesis, clearly demonstrates the need to incorporate behavioural economics into economic models. This was strongly confirmed by the behavioural characteristics of market participants in the run-up to the 2008 crisis, as much of it was inconsistent with the description of the paradigm of rational behaviour under optimal awareness.

Stiglitz (2014) also criticises Keynesian-based models using Hicks' fixed wage/price theory. Recognising the possibility of involuntary unemployment as a 'market failure' does not mean that these models are 'good'. The model assumes that with a wage flexible downward, if the wage earners accepted lower wages, and were not prevented to do so by unions and sometimes by the state, then the labour market could be cleared up, and the economy would return to a potential growth. The crisis has also shown the flaws of these models, as in its early years the US – which has perhaps the most flexible labour market among developed countries – performed much worse than the northern European countries. According to Stiglitz, in fact, these models were discredited much earlier, as there were high unemployment rates in many countries where there was little or no union or state regulation to protect labour.

Stiglitz believes that transforming economics requires alternative models that can provide better answers to the three main questions behind deep recessions:

❶ What may cause the disorder? – According to standard models, the external technology shocks; although the reality is that market participants trigger these incidents.

❷ Why do small shocks seem to have a great effect? – Contrary to classic theory, the system does not blunt shocks rather often amplifies them.

❸ Why does the downward phase last so long when we have at hand the same human, physical and natural resources before and after the crisis? – Standard theories do not explain the delay.

Hysteresis has become a central topic of economic analysis, not only for its theoretical importance but also for its practical repercussions. *Ball* (2014) attempted to measure long-term losses derived from hysteresis. The conclusion was that countries with the deepest recession can expect the greatest losses in the long run. Based on the aggregate figures of 23 countries, the potential output loss was 8.4 percent in 2015 according to Ball, the size of the German economy, as though the crisis would have entirely wiped the latter out.

Ball suggests that it would be important to clarify whether the effects of the crisis are asymmetric, in order to make it possible to respond in the long run to the damage it causes.

CYCLE AND TREND RELATIONSHIP, SECULAR STAGNATION

According to the traditional approach, the supply-driven long-term growth equilibrium path – the trend – is unaffected by short-term cyclic fluctuations in demand; consequently, the output should return to its original path defined by the trend, within a few years.

On the Actuality of the Theory of Secular Stagnation

Concerning the relationship between trend and cycle, the concept of slowing down the trend naturally (e.g. due to demographic or technological reasons) has emerged in interpreting the slow recovery after the crisis. *Summers* (2013, 2014, 2016) pointed out the potential danger of the secular stagnation[4] becoming current. He raised the question of whether it is possible that the US and major economies will not be able to return to full employment and stable growth without unorthodox economic policies. Short-term interest rates have been significantly distorted by the zero lower bound, and real interest rates may not have fallen sufficiently to encourage investments to the level needed for full employment. In addition, falling prices and wages had an exacerbating effect by encouraging consumers and investors to postpone their spending.

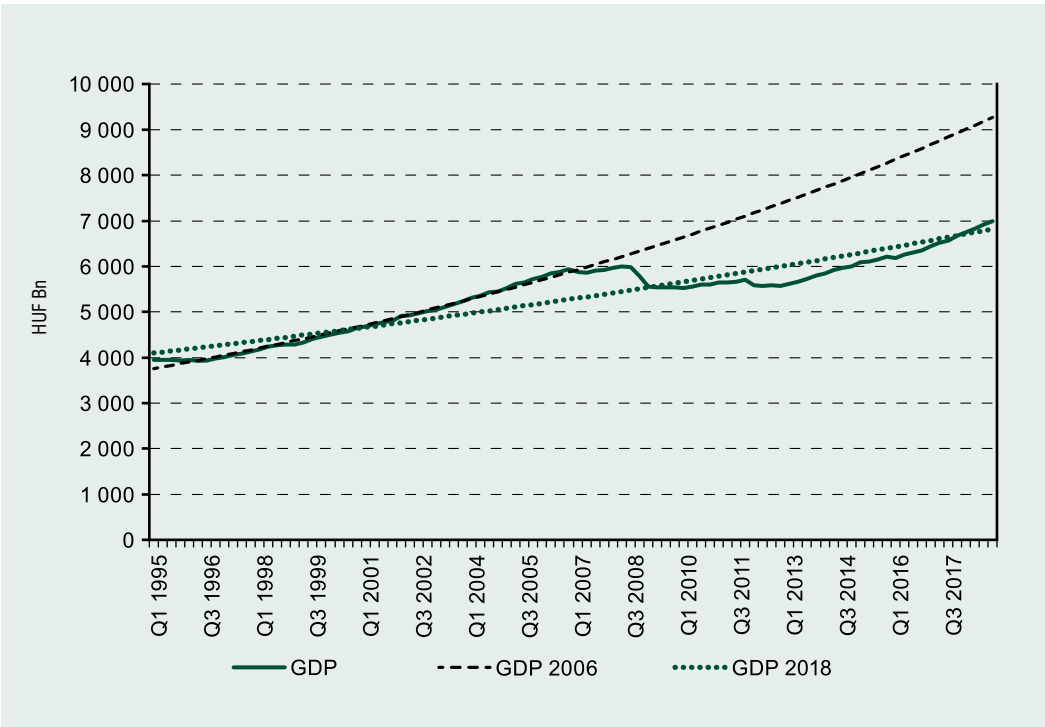
According to Summers (2014), long-term growth trends may be adversely influenced by changes in business cycles, especially when the efficiency of monetary policy is questioned at zero lower bound. The US economy in 2014 performed 10 percent lower than it was projected for that year in 2007. 5 percentage points resulted from the 2013 revision of the trend estimate and another 5 percentage points from the estimated output gap. In terms of employment rates, the post-crisis decline was only slightly offset in the 25-54 age group.

Craighead (2019) demonstrated with the help of a new Keynesian model that the impact of a shock on the economy also raises the natural level of the unemployment rate as a result of the efficiency of the labour market and, consequently, the increase in the number of long-term unemployed, ergo it has a structural effect.

The situation in Hungary was similar. Extrapolating the GDP growth trend between 1995 and 2006 to 2018 shows that real GDP in 2018 was 32.6 percent below the pre-crisis trend *(see Figure 1)*. Summers (2014) estimates that the backlog in the US is mainly due to slower capital growth and lower working

Figure 1

VALUE OF HUNGARIAN GDP AT 2005 PRICES AND TREND ESTIMATE ESTABLISHED BY 2006 AND 2018



Source: Hungarian Central Statistical Office (HCSO), and own calculations

hours. By contrast, in Hungary, according to our calculations, the employment rate stood at a higher level than previously as a result of post-2010 reform measures. However, the backlog was to a greater extent due to lower productivity of recruited new labour and, to a lesser extent, to lower level of available funds. *Váry* (2019) also confirmed that the 2008 crisis had a long-term impact on most advanced economies.

The crisis has hit Hungary much harder than its regional competitors due to its past over-indebtedness. Strategic changes were needed for the economy to recover, as presented in the study by *György and Veress* (2016). The most important elements of this are the following:

- Increasing employment – reducing the number of people living on aid and activating them in the labour market;
- Reducing the tax burden on SMEs;
- Introducing sector-specific taxes, which made possible to reduce taxes on labour;
- Increasing net wages;
- Reducing external debt;
- Reducing the foreign currency ratio within the public debt;
- Increasing the state's share in operating assets.

According to the study, post-2010 economic policies aimed at addressing previous strategic missteps. They succeeded in putting the economy back on the path of

growth following previous imbalances. The new economic strategy also affected the system of public finance (Domokos, 2011). *Domokos* argues in favour of the need for institutional restructuring with disciplined budget policies as well as sound and responsible public finances, demonstrating past failures. In this context, he analyses the debt rules in the Fundamental Law, the transformation of the National Fiscal Council and the State Audit Office of Hungary. *Lentner* (2015) emphasises the importance of sharing the social burden and on the involvement of the government (in monetary policy and control of public finance) within the context of the economic policy shift since 2010.

From a hysteresis point of view, these changes mean that GDP has fallen short of expectations on account of the effects of the crisis; however, as a result of the strategy change, the Hungarian economy has been able to set itself on a higher growth path; thus, potential growth may also be higher than in the past. This can also be called a positive hysteresis, which means that as a result of successful reforms potential growth reaches a higher level, positioning the economy not under, as previously expected, but on top of the potential growth path. The question is, of course, what would happen during another crisis. In this very case, positive hysteresis is valid too, inasmuch as the impact of the crisis, and hence the extent of the long-term decline may be smaller than before as a result of economic policy reforms.

In contrast, many EU countries have not managed to overcome the crisis for the lack of unconventional measures: Greece's GDP at 2005 prices was 23.6 percent lower in 2018 compared to 2008; Italy's was lagging behind with 3.3 percent. All of this could have happened despite the introduction of ECB's unconventional monetary policy instruments in both countries; however, these measures have not proved to be sufficient in themselves. According to Summers (2014), the pre-crisis growth rate was unsustainable, which is explained by the exaggerated increase in real estate prices, up to 100 percent on an annual basis in certain periods. However, no such tendency can be seen in Hungary, and before the crisis, real estate prices have rather tended to decline. This was also accompanied by a significant increase in the debt-to-income ratio in the US, which was also observed in Hungary *(Figure 2).*

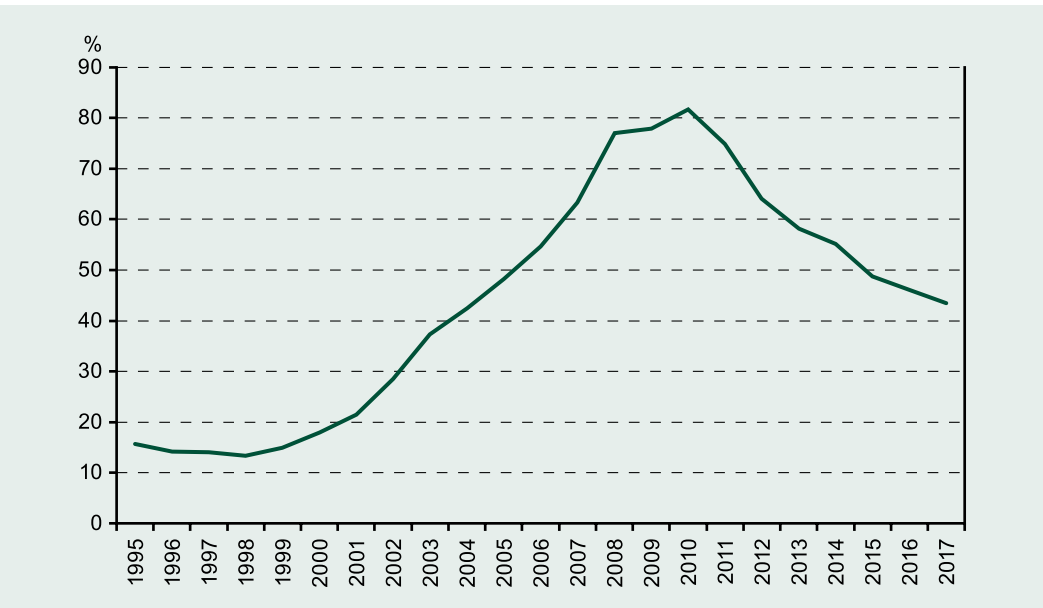
The relative price of capital goods has been steadily declining except for the years of the 2008 crisis (Summers, 2014). In addition, as we may observe, central banks have accumulated substantial reserves, disproportionately in highly secure assets. The combined effect of the above is a significant reduction in the natural interest rate. The decline in real interest rates can also be observed in Hungary: inflation of around 3 percent is accompanied by central bank base-rates and interbank interest rates below 1 percent.

ON THE CRITICISM OF THE THEORY OF SECULAR STAGNATION

Rogoff (2015) criticised the theory of secular stagnation and explained the delay in recovery with the characteristics of the financial cycle. This is evidenced by the U-curve of per capita income, along with the rate of decline in output, which typically characterises recovery from deep financial crises. The financial cycle also explains the size of the real estate (mainly housing) bubble and its burst, the level of leverage that accompanies the bubble, the evolution of asset prices before and after the crisis, and the fact that after the crisis the rise in unemployment has been far more sustained than after an ordinary recession that is not accompanied by a financial crisis. As a result of

Figure 2

DEBT/INCOME RATIO OF HOUSEHOLDS IN HUNGARY BETWEEN 1995 AND 2017



Source: HCSO, Central Bank of Hungary (MNB), and own calculations

rising loans, asset prices rise, increasing their value as collateral, thereby facilitating loan expansion and further asset price increases. When the bubble bursts, the whole process breaks into the radical opposite of the previous one. According to the author, too much emphasis has been put on orthodox economic policy responses tailored to the crisis and too little on unorthodox ones, though they are better suited to dealing with a crisis exacerbated by a financial market crisis. Decision-makers should have enforced debt write-offs more strongly in the process of bank consolidation and recapitalisation. In addition, according to Rogoff, a more aggressive rate hike policy prior to the outbreak could have avoided the problem of zero interest rates. Fiscal policy (one of the tools of the orthodox response) was initially useful, but then many countries prematurely restrained spending.

According to the author, secular factors (demographic decline in developed countries, expected decline in female labour inflow into the economy, or slowing growth in Asian countries) have always played a role in the outbreak of the crisis, while bank crises have always been linked to facts having much deeper roots, while they were rather mechanisms for reinforcing the crisis, not the triggers of them. Stiglitz (2014) expressed doubts about the role of real interest rates. In his opinion (especially outside the real estate sector), there is insufficient evidence of the impact of the real interest rate on investment, rather the nominal interest rate is significant. The traditional mechanism, which provides that lower interest rates can have a positive long-term effect on the economy, is triggered by increased inflows of more favourable loans. However, this does not play a role today for the following reasons:

❶ The situation of the most credit-constrained companies, mainly SMEs, has remained unchanged and their supply of financial resources remains limited. While large banks were given significant funds, restored their balance sheets through monopoly profits and speculative profits, smaller regional and community banks, on which SMEs depend, remained weak.

❷ Large multinationals have accumulated significant cash holdings. If the interest market did not encourage them to invest, a smaller change in interest rates should not be enough either.

❸ Bank consolidation for preserving the banking system has created non-competitive markets where market leaders did not share lower interest rates with consumers, rather enjoyed even greater margins.

❹ In a globalised world, money flows where returns are higher: so it goes where it is not needed, not where it should be.

❺ The activities of central banks are often contradictory: one provides liquidity while the other restraints it.

According to the logic of standard models, companies have access to capital at low interest rates in the long term and will consequently finance capital intensive investments as the cost of capital goods is lower than that of wages. This means that at any level of output, employment will decline, meaning loose monetary policy may lead to a rise in unemployment. However, Stiglitz does not argue for the need for tighter monetary policy, but maintains that for incentivising the economy, rather than monetary policy, a different economic policy is required.

Eggertsson et al. (2019) modelled secular stagnation using an overlapping generations (OLG) model. They argue that low interest rates – contrary to the assumptions formulated in the literature – are not only temporary, but they also do not automatically disappear, they should be eliminated. Two solutions are being explored to eliminate negative real interest rates: raising the inflation target, and applying a fiscal stimulus. Raising the inflation target is less recommended, given the need for a large increase in target, on the one hand; moreover, it wouldn't eliminate the secular stagnation behaving as an equilibrium, on the other hand. In contrast, fiscal expansion may be appropriate to solve problems.

Summers' (2013, 2014) secular stagnation theory goes beyond the traditional interpretation of the trend-cycle relationship, demonstrates and quantifies the trend-destroying effect of the cycle, emphasises the importance of the lack of demand, and considers increasing demand by the means of increasing public investment. Rogoff (2015) and Stiglitz (2014) criticised Summers for using the model to represent the natural real interest rate as a general equilibrium factor, remaining within the limits of the traditional theoretical concept. Stiglitz also highlights a number of factors in the economy, which in the current economic climate, may call into question the efficiency of the orthodox monetary measures, thus challenging the dominant pre-crisis theoretical trend. Rogoff's concept that explains pretended secular stagnation by a financial crisis, points to the limited efficiency of using the anti-crisis orthodox toolkit in managing the financial crisis, and underlines at the same time that embedding lending super-cycles in a macroeconomic model is a major constraint on the pre-crisis dominant theoretical trend.

After having a closer look at the Hungarian figures, we have to agree with Summers that we have to go beyond the traditional interpretation of the trend-cycle relationship. Contrary to the theory of secular stagnation, it is important to emphasise the role of financial cycles, which also contributed significantly to the prolongation of the crisis in Hungary, due

to the over-indebtedness before 2008, as well as to the freezing of borrowing. At the same time, securing access to credit and thereby reducing interest rates played an important role in the recovery from the crisis. However, these investments, although being in many cases capital intensive financing, did not entail a reduction in labour demand rather an expansion due to their nature to expand capacity. However, we also agree with Stiglitz's finding that nominal interest rate evolutions are more important than real interest rate ones, as the former is easier to cope with for borrowers.

THEORIES ON THE RELATIONSHIP BETWEEN HYSTERESIS AND TECHNOLOGICAL DEVELOPMENTS AND INVESTMENTS

The long-term growth of a country is significantly determined by its investments in R&D, infrastructure projects, and human capital (Verspagen, 2005). A critical element of the relationship between trend and cycle is the correlation that links technological development, innovation and investment activity. Technological progress is reflected in the economy through innovation activities via investments, while investments show a cyclical dependence; consequently, it is hysteresis that influences technological progress in the development of both investment and innovation activities.

Regarding the role of supply and demand, and innovation in hysteresis, *Reifschneider et al.* (2015) analysed the supply-side damage suffered by the US economy as a result of the crisis. They found out that, according to the 2000-2007 trend, the loss was about 7 percent of potential output by the end of 2014. They estimate that labour productivity has suffered the most significant decline compared to the trend, as a result of a sharp decline in the accumulation of capital and a slower increase in the ratio of aggregate output (total-factor productivity, TFP). The decline on the supply-side is seen as an endogenous response to weak aggregate demand. The slower rise of the TFP is due to a disproportionate reduction in the number of new entrants using the latest technology during the downward phase of the cycle.

Garcia-Macia (2015) highlighted the role of intangible capital and innovation. He found that financial shocks significantly increase the cost of financing intangible capital, and the resulting decline in the accumulation of intangible capital causes that output remains below trend. An analysis of data from the Spanish manufacturing industry revealed that more than half of the decrease in value added between 2008 and 2013, was due to the specific characteristics of intangible assets.

Because intangible capital is harder to accept as collateral for loans than is tangible capital, lenders expect a lower rate of return in the event of insolvency, which increases the cost of intangible capital during financial shocks.

The recession in the Spanish manufacturing industry has been accompanied by high indebtedness, a fall in investment, as well as a large-scale dissolution of companies that use intangible capital intensively. The author also states that the spread of innovation is always slower with less depreciation of capital. This infiltration factor alone nearly doubled the expected catch-up time for GDP. The author stated that the faster recovery in the US was partly due to the fact that in the US the role of private equity is more significant, while innovation in Europe is essentially credit-driven.

Garcia-Macia has criticised a program developed by the European Union known as the *Juncker Plan,* in which the size of credit

support for riskier investments is determined by company size. Instead, he suggests that companies shall be offered an age-based capital transfer allowance that would mitigate the effects of financial shocks, make it easier for younger companies to obtain credit, so they will be provided with higher rates of return as a result of tangible and, in particular, intangible investments. At the macroeconomic level, this would result in healthier asset allocation and higher growth path. According to this model, if his proposal had been implemented from 2009, it would have reduced the GDP gap from 13.2 percent to 2.7 percent for the period between 2008 and 2013.

Bianchi et al. (2014) in their dynamic stochastic general equilibrium (DSGE) model treated technological development as well as adaptation and penetration rates as endogenous factors, and then examined the impact of the 2001 recession and the 2008 crisis on technological development. The analysis showed a close relationship between business cyclical fluctuations and long-term growth dynamics. The positive shock of marginal investment efficiency leads to an increase in physical capital investment, which increases the marginal productivity of R&D capital (i.e. knowledge capital) due to increased production. Higher emergence of R&D capital and higher technology adoption and implementation rates lead to sustained growth as a result of circulation of knowledge, which plays a significant role in the consequences of recessions, especially over a longer time period.

The authors concluded that the 2008 crisis was accompanied by a significant decline in technology adaptation and its implementation rates, while R&D remained basically unaffected. In the recession of 2001, R&D investments declined substantially following the burst of the information technology bubble; nevertheless, only a slight change in technology adaptation rates occurred. The recent recession was much more severe in the short term, in spite of that was less pronounced as to the growth of the trend in the longer term than in 2001.

According to Eurostat, the value of R&D expenditures to GDP ratio in the Visegrád countries (i.e. CZ, HU, PL SK), as well as in the EU, was not influenced by the 2008 crisis, nonetheless investment volumes fell *(see Figure 3).*

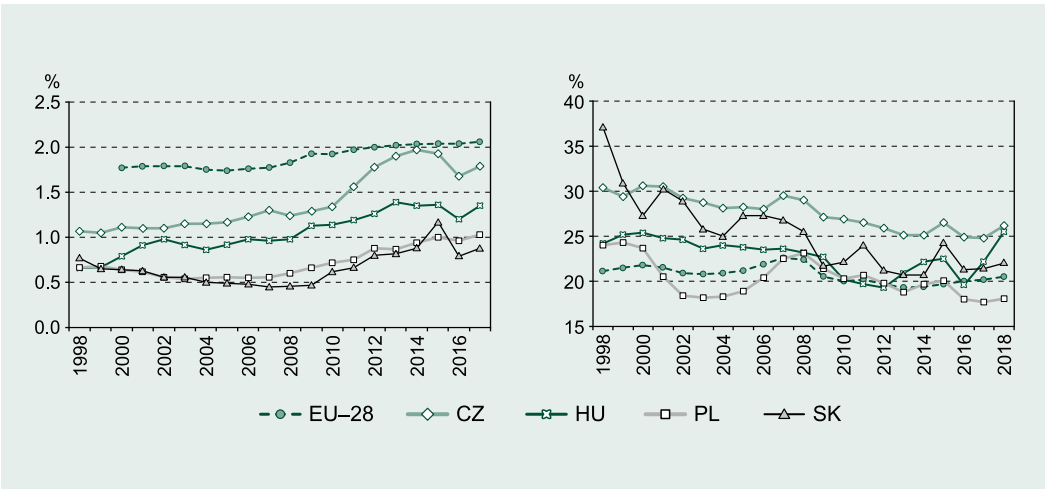
Sedgley et al. (2018) examined the impact of business cycles on business R&D spending in 22 developed countries. According to their results, companies' R&D investments are pro-cyclical even when credit constraints are taken into account, and the responses to the cycle are symmetrical. Evidence has also been found that there is a link between borrowing trends and R&D spending, but this is less due to credit constraints than to a decline in credit demand.

As a result of the crisis, debates have also emerged (Bianchi et al., 2014) on how innovation and technological development should serve sustainable growth, with particular emphasis on state involvement.

According to *Mazzucato and Perez* (2014), the post-crisis situation could not be treated through standard budget and monetary policy instruments, even when complemented with the reform of the financial system. Major institutional innovations are needed to overcome an economy dominated by monetary policy, and the social discrepancies resulting from deeply polarised income relations. This requires the provision of profitable opportunities for an enormous innovation potential and the creation of the conditions of fair income distribution. According to the authors, for the development of innovation-led growth financial and macroeconomic growth policy reform is needed, where 'smart' and inclusive growth is state-led and innovation-

Figure 3

R&D AND INVESTMENT EXPENDITURES AS A PERCENTAGE OF GDP



Source: Eurostat

led. This can only go hand in hand with the reform of the current model of state control, which will result in an enhanced incentive for companies to reinvest their profits in sectors that create long-term value, such as human capital training or R&D. It is necessary for the state to set a clear direction for innovation, to elaborate a coherent policy, and to shape the playing field as well as the rules of the game to reward companies that are willing to and able to invest in future opportunities.

In our opinion, the cyclical fluctuation of R&D&I spending is a natural process: in the event of a crisis, businesses can easily downsize these activities in the short term; however, it may result in a competitive disadvantage in the long run. In Hungary, the tendency of companies to innovate is low anyway, so in the case of a future crisis efforts must be made not to reduce it to an even lower level, connecting to *Bianchi et al.* (2014) study, we can emphasise that the state can also play an important role, as it can help sustain R&D activities.

HYSTERESIS, RELATIONSHIP BETWEEN FINANCIAL CRISIS AND CYCLES

One of the main triggers of the 2008 crisis was the real estate bubble in the 2000s, followed by a financial crisis, which was hounded by forced balance sheet adjustments (Kiss and Szilágyi, 2014; MNB, 2016). The crisis has shown that debt can negatively affect long-term growth opportunities. *Reinhart and Rogoff* (2010) concluded that once a country's debt reaches 90 percent of the GDP, additional debt significantly damages growth. However, many criticised their findings. Stiglitz (2014) emphasises that forms of expenditure and the effects of general economic conditions must be taken into account if such rates are to be determined. *Herndon et al.* (2014) suggest that Reinhart and Rogoff made methodological errors in data cleansing and weighting, which led to a broader scale of growth for the countries concerned.

According to *Minsky's* (1992) hypothesis, financial markets are prone to instability

and bubbles may take shape within market economies. If for some reason, the investment market starts sparkling, high returns from the effervescent type of instruments are expected, and investors keep reinvesting. And banks will issue more credit while loosening conditions. Those who leave when price is at its climax can make big profits, and when the bubble begins to shrink, panic breaks out and almost everyone wants to get rid of their investment at once. In this process the so-called Minsky-moment occurs when banks and other lenders are forced to sell even their safe assets in order to pay off their due obligations. In the inevitability of financial market bubbles and financial instability, Minsky believes that when times are better, banks increase their risk tolerance level hoping for high returns, and borrow more and more to finance these assets and increase their profits.

Regarding the specific effects of lending activity, *Guzman* and Stiglitz's (2015) Pseudo-Wealth theory draws attention to the disadvantage of relatively small-scale effects being not reflected in models (such as different expectations of different economic agents) that may, however, result in large-scale drifts in the real economy. The practical implication of this finding is that if economic policy does not take this into account, it will underestimate the time of recovery (as it was the case with the IMF and Fed models). The model is based on the logical assumption that economic agents may try to exchange their different expectations for cash, for example, on futures markets. The authors called future profits expected by the parties 'pseudo-wealth', which can trigger economic actions similar to the consequences of real assets. In turn, a fall in consumption due to the decline in pseudo-wealth may lead to falling outputs, and as a direct consequence of it to lowering prices and real wages, which may increase the real burden of debt and further reduce consumption. This can cause problems due to price and wage rigidities: excessive price or wage reductions on non-indexed debt increase the real burden of repayments, reduce aggregate demand, which further reduces prices and wages.

The pseudo-wealth theory can also be fitted with the example of Hungarian foreign currency lending. At the time of borrowing, debtors expected much lower instalments, leading to a fall in aggregate demand in the post-crisis period, while drawing an excessively high consumption trajectory before the crisis. However, in case of an economic crisis, it is not just the decline in pseudo-wealth that is causing the problem: lending constraints become effective forcing debtors to reduce their outstanding loans, and households free from loans increasing their prudential savings, thereby narrowing aggregate demand (Guerrieri and Lorenzoni, 2017).

According to Stiglitz (1990), if a product is priced high on the market, actors may think that this will be the case in the future, which may cause real changes in the real economy. Regarding the bubble, he believes that if investors' expectations reflect that they believe the asset can be sold at a higher price than expected, the price of the asset will increase. According to Stiglitz, a bubble is created when today's high price is based simply on investors' belief in the future high price, but real factors do not justify it.

Internal disruptions in the real-world financial system sometimes distort the efficiency of transmission channels to the real sector. The role of the institutions responsible for the operation and supervision of the financial system is essential both ex-ante and ex-post. However, economic bubble formation raises the need for a deeper examination of *Minsky's* (1992) assessment of whether this phenomenon is immanent to the economic system of our time. Of course, after most crises, stabilising measures are taken both

on the regulatory and institutional side, but deeper analyses could help to clarify how deep the roots are buried into the system, and what are its connected underlying pillars (e.g. short-term profit motive). Without this, the recurrence of financial crises will be difficult to prevent. In the context of the crisis, significant progress has been made in the regulation and supervision of financial institutions in the developed world, including Hungary. This included consolidating the relationship between financial institutions and their clients, with the MNB placing a strong emphasis on consumer protection in general as well as on the protection of vulnerable consumers in particular (Lentner, 2016). Previous micro-prudential supervision was complemented by macro-prudential supervision and regulation, which also takes into account the relationship between the actors of the system. In our opinion, however, it would be over-confident to say that the real sector should not be subject to disruption caused by the financial system.

HYSTERESIS AND THE USE OF THE FISCAL MULTIPLICATOR

The 2008 crisis has raised theoretical interest in the budget policy issues of economic theories, especially since fiscal consolidation has become a prominent feature of the US and Europe during the crisis (Borsi, 2016). The theory is complicated by the fact that the multiplier effect is not observable, rather it can only be estimated. The differences are not due to the application of different models; the different results are imputed to different measurement methods, to the content of fiscal policy measures, as well as to differences in economic conditions and trust management.

Whalen and Reichling (2015) report the multiplier measurement results achieved by the Congressional Budget Office (CBO) model in the short and long term. The short-term impact is directly reflected in the demand for goods and services. In the longer term (over this time current output catches up with potential output), budget policy can influence output by altering work, savings as well as investment incentives for individuals and businesses alike. The immediate effect depends on the intervention. Spending USD 1 on goods or services increases your demand by USD 1. If the USD 1 appears in a tax or transfer change, the effect depends on how the subject responds to it. Indirect effects can enhance multiplication phenomena: if through direct effects demand for goods and services raise, it shall encourage the private sector to increase investment and recruit new employees. But it can also be weakened if, as a result of government tax cuts or spending increases, higher interest rates are obtained, which further reduces investment and consumption. *Table 1* below shows the CBO's estimate of US fiscal multipliers.

It can be seen that the multiplier for direct purchases of goods and services is the highest – covering a fairly wide range – while the lowest is the corporate tax provision that primarily concerns cash.

Cebi and Özdemir (2019) examined the characteristics of fiscal multipliers on Turkish data. They found that the value of the fiscal multiplier is higher in periods of lower economic growth, and the multiplier of government investments is higher than the multiplier of government purchases regardless of whether the economy is in low or high growth period.

Mirdala and Kamenik (2017) estimated fiscal multipliers for the Czech Republic, Slovakia and Hungary based on data for the period between 1995 and 2015. In their analysis, both expenditure and revenue multipliers were quantified, and separate calculations were made for periods of low and high growth.

Table 1

RANGES FOR U.S. FISCAL MULTIPLIERS

Type of Activity	Lower estimate	Top estimate
Purchases of Goods and Services by the Federal Government	0.5	2.5
Transfer Payments to State and Local Governments for Infrastructure	0.4	2.2
Transfer Payments to State and Local Governments for Other Purposes	0.4	1.8
Transfer Payments to Individuals	0.4	2.1
One-Time Payments to Retirees	0.2	1.0
Two-Year Tax Cuts for Lower- and Middle-Income People	0.3	1.5
One-Year Tax Cut for Higher-Income People	0.1	0.6
Extension of First-Time Homebuyer Credit	0.2	0.8
Corporate Tax Provisions Primarily Affecting Cash Flow	0.0	0.4

Source: Wahlen–Reichling (2015), p. 11

They find that in all three countries the impact of expenditure shocks is higher than of revenue. In Hungary and the Czech Republic the value of the fiscal expenditure multiplier is higher in times of crisis. In Slovakia there is no significant difference, as the impact of the expenditure shock is always high and the revenue shock is always low *(see Table 2).*

Solow (2012) emphasised that there is an extremely wide variation in the perception and magnitude of the multiplier as far as professionals' opinion is concerned, which tends to negatively affect the acceptance of the metric. Those who disapprove the use of the multiplier tend to attest a smaller multiplier. With regard to multipliers he calls our attention to the following:

❶ The multiplier depends on the current state of the economy and the course of economic policy applied. The revision of the multiplier estimate should take into account that there may be a bidirectional causal link between aggregate demand and budget expenditure, and thus, the assumptions should be made under the presumption of an economic environment with significant oversupply.

❷ Taking monetary policy into account. If the central bank acts according to the Taylor rule, monetary policy acts as a quasi-automatic stabiliser, as the central bank must offset – at least in part – any increase in real GDP, even if general economic conditions are weak. The magnitude of the impact of fiscal policy depends on the strength of the central bank's backlash. In the event of a deeper recession, the Taylor rule would require negative (real) interest rates, but the central bank has less room for manoeuvre in this range, so it does not respond as strongly to fiscal policy intervention; consequently, the multipliers are higher.

❸ The effect of disposable income growth on savings induced by economic policy. When households have a high debt burden, even relatively poor families tend to increase their loan repayments instead of consuming the extra income provided by the state, which reduces the size of the multiplier.

Another disadvantage of stabilisers, according to Solow, is that they act in the direction of smoothing fluctuations. That is, when the output reaches its peak and begins

Table 2

4 QUARTERLY CUMULATED FISCAL MULTIPLIER IN THE SLOW AND FAST GROWTH PHASE BETWEEN 1995-2015

	Expenditure Shock		Revenue Shock	
	Low growth	High growth	Low growth	High growth
Czech Republic	0.33	-0.32	0.06	-0.15
Hungary	0.58	0.10	0.24	0.05
Slovakia	0.60	0.72	0.01	0.10

Source: Mirdala és Kamenik (2017), p. 57

to fall, forces against downward movement are preferred, but when the output reaches its lowest point and begins to rise, it is unfavourable if the same moderates the recovery.

From time to time, it could also be beneficial to introduce a tax system linked to the Okun-gap[5], where changes in the gap would determine tax rates. Such a system would, in theory, facilitate the achievement of the target output level and prevent its displacement. However, due to the temporary application, this seems difficult to imagine. The problem with this is that economic policy does not know where the economy stands within the business cycle, it can only be assessed afterwards. In Hungary, before the crisis assumption had it that output gap was negative, although it turned out to be the opposite afterwards. According to Solow, increasing world trade and free movement of capital raise the need for international coordination of budgetary policies.

The work of *Stiglitz* (2014) stands out from the most important theoretical findings concerning the multiplier. According to it, the size of the multiplier is the most important issue in periods of high unemployment and low production capacity. It raises three problems:

❶ Unemployment and exploitation of labour capacity have not been as high since the crisis of 1930 as they were at the time of the crisis of 2008; having said that, today's structure of the economy is very different from that of the time, and therefore, previous experience cannot be applied to the current situation with reliability.

❷ Neoclassical theories measured the multiplier effect in the short term – 2 years – as they assumed that the economy would return to full employment within this time. With the recent extended setback, it has become clear that the multiplier effect can only be measured over the long term.

❸ Another question is whether there is a crowding out effect. But that depends on monetary policy: in the case of a persistent loose monetary policy, there is no such effect. We have a demand-creating effect here, as government spending also stimulates private investments (*crowding-in*).

According to the *Barro–Ricardo* hypothesis, an increase in government debt triggers an increase in savings for offsetting the expected higher tax burden on households. Thus, the government spending causing the escalation of debts has a crowding out effect on consumption. According to Stiglitz, this thesis cannot be applied to contemporary economy, since, in practice, augmentation in public expenditures covered by the deficit is incrementing consumption today. If the state spends on high-yield investments when real

interest rates are negative, the government balance will be improved, savings will shrink, and a consumption growth is generated.

If the downward trend of the economy is sustained, some of the current savings will be spent on future consumption. Assuming rational expectations, individuals know that future incomes will be higher, which means that their lifecycle consumption prospects are expected to be improved, which further may lead to increased consumption in the present.

A well-established multiplier estimate takes into account that different types of spending have different effects. It does not matter what the multiplier was in the past, but how efficient government spending is in the present.

To sum it up, within the context of the above mentioned theoretical fermentation initiated in relation to the multiplier, a number of important and compared to the orthodox valuations forward-looking conclusions were born, which may help to define criteria for the economic theory against those specific multipliers and their compelling application. Moreover, it has been established that the development of the multiplier requires a combination of credit and business cycles, taking also into account the types of government spending.

The openness of the country is another factor that has to be taken into consideration for Hungary. Consequently, not only the way we stimulate demand, but also the targeted sector matters, as the range of products and services purchased by each sector and the value added from imports are different. Extensive research on the estimation of multipliers would be crucial for our country because fiscal policy has limited flexibility; necessarily, the efficient use of available funds is a pivotal question. A detailed examination of fiscal multipliers could be applied not only to fiscal stimulus measures in crisis situations, but also to the use of EU funds, while taking into account the relationship between cycles and the fiscal multipliers for time distribution. In relation to this, in her study, *Vörös* (2018) draws attention to the problems of multiplier estimation in the context of cost-benefit analyses.

CONCLUSIONS

As a result of the 2008 crisis and the subsequent slow recovery, macroeconomics runs into a dire straits. This is true for both the handling of theoretical relationships and the methodology. And the experience telling us the truth: what happened during and after the crisis could not have happened and especially not in this way, according to mainstream theories. This is most clearly expressed in one of the headings of Stiglitz's frequently quoted work: '*Back to the Beginnings*'.[6]

In order for macroeconomics to fulfil its expected role in society, that is, to explain macroeconomic developments empirically, to assist economic and social development through economic policy guidance; moreover, to set the economic criteria for sustainable development, it must be reformed.

In addition to the macroeconomic interpretation of positive trends and the complex presentation of forces affecting equilibrium, it is also necessary to thoroughly map the system's characteristics when equilibrium is lacking, and to demonstrate its operation, starting with the potential causes.

As a result of the crisis, the practice of active budgetary policies has been strengthened, which is an encouraging sign of a theoretical shift towards providing constructive theoretical solutions. However, it gave us mixed results, since after the crisis, many countries that have been able to pursue active budgetary policies on the basis of their budgetary conditions, have abandoned it.

It is also a question of whether history

repeats itself and the same economic-theoretical restoration that followed the Keynesian Revolution takes place.

In addition to the need for a small open country, such as Hungary, to adapt to the international environment, internal room for manoeuvre embraces a strengthening theoretical training, the possible establishment of new public institutions for this purpose, and the theoretical knowledge (both orthodox and unorthodox) required to meet economic challenges at national level, as well as transfer and development of knowledge. It is important to be able to learn from the mistakes of the past (such as over-indebtedness) and not to repeat them so that the next crisis does not slow us down significantly compared to the trend. The goal is to continue to talk about positive hysteresis, in other words, the economy shall grow faster than previously anticipated as a result of the economic policy shift, and shall avoid such downturn in the event of a crisis.

Notes

[1] The study prepared by the Századvég Political School Foundation for the Central Bank of Hungary (Magyar Nemzeti Bank) in May 2017 was the starting point of this paper.

[2] In this work, the authors use the term in relation with employment, and extend the meaning of the term to persistence of unemployment, and the long-term effects of shocks on unemployment.

[3] *Blanchard* (2008), p. 2

[4] The concept was introduced by *Hansen* (1941) and refers to a state of the economy where capital accumulation is not large enough to enable full employment.

[5] This is the difference between the actual and potential level of GDP growth.

[6] *Stiglitz* (2014) p. 3

References

Ball, L. M. (2014). Long-term damage from the Great Recession in OECD countries. *NBER Working Paper* 20185, https://doi.org/10.3386/w20185

Bianchi, F., Kung, H., Morales, G. (2014). Growth, Slowdowns, and Recoveries. *NBER Working Paper Series*, Working Paper 20725, https://doi.org/10.2139/ssrn.2577505

Blanchard, O., Summers, L. H. (1986). Hysteresis and the European Unemployment Problem. *NBER Macroeconomics Annual*, 1, pp. 15-78, https://doi.org/10.3386/w1950

Blanchard, O. (2008): The state of macro. *NBER Working Paper* 14259, https://doi.org/10.3386/w14259

Blanchard, O., Dell'Aricci, G., Mauro, P. (2010). Rethinking macroeconomic policy. *IMF Staff Position Note*, SPN/10/03, https://doi.org/10.5089/9781455224982.004.a001

Blanchard, O., Summers, L. (2015). Hysteresis and European Unemployment Problem. In: Fischer, S. (ed.): *NBER Macroeconomics Annual,* https://doi.org/10.3386/w1950

Borsi, M. T. (2016). Banco de Espana: Fiscal multipliers across the credit cycle. *Documentos de Trabajo.* No. 1618, https://doi.org/10.2139/ssrn.2836430

Cebi, C., Özdemir K. A. (2019). Cyclical variation of the fiscal multiplier in Turkey. *Emerging Markets Finance and Trade,* 1-15, https://doi.org/10.1080/1540496x.2019.1592748

Craidhead, B. (2019). Hysteresis in a New Keynesian Model. *Economic Inquiry,* 57(2), pp. 1082-1097, https://doi.org/10.1111/ecin.12737

Domokos, L. (2011). Credibility and Flexibility—Changes in the Framework of Hungarian Public Finances. *Pénzügyi Szemle (Public Finance Quarterly)*, 2011/3, pp. 285-296

Eggertsson, G. B., Mehrotra, N. R., Robbins, J. A. (2019). A Model of Secular Stagnation: Theory and Quantitative Evaluation. *American Economic Journal: Macroeconomics*, 11(1), pp. 1-48, https://doi.org/10.3386/w23093

Guerrieri, V., Lorenzoni, G. (2017). Credit Crises, Precautionary Savings, and the Liquidity Trap. *The Quarterly Journal of Economics*, 132(3), pp. 1427-1467, https://doi.org/10.3386/w17583

György, L., Veress, J. (2016). 2010 utáni magyar gazdaságpolitikai modell (The Post-2010 Hungarian Economic Policy Model), *Pénzügyi Szemle (Public Finance Quarterly)*, 2016/3, pp. 367-388

Guzman, M., Stiglitz, J. (2015). Pseudo-wealth and Consumption Fluctuations. *Columbia University Working Paper*, presented at the World Congress of the IEA, June 2014, https://doi.org/10.3386/w22838

Hansen, A. H. (2003). *Fiscal Policy and Business Cycles.* Routledge, https://doi.org/10.4324/9781315016412

Herndon, T., Ash, M., Pollin, R. (2014). Does high public debt consistently stifle economic growth? A critique of Reinhart and Rogoff. *Cambridge Journal of Economics*, 38(2), pp. 257-279, https://doi.org/10.1093/cje/bet075

Kiss, Á., Szilágyi, K. (2014). Miért más ez a válság, mint a többi? (Why is This Crisis Different Than the Others?) *Közgazdasági Szemle (Economic Review)*, vol. LVII, September 2014, pp. 949-974

Lentner, Cs. (2015). The New Hungarian Public Finance System—in a Historical, Institutional and Scientific Contexts. *Pénzügyi Szemle (Public Finance Quarterly)*, 2015/4, pp. 458-472

Lentner, Cs. (2016). *Rendszerváltás és pénzügypolitika – Tények és tévhitek a neoliberális piacgazdasági átmenetről és a 2010 óta alkalmazott nem konvencionális eszközökről (Change in the Economic System and Financial Policy—Facts and Misbeliefs about the Neoliberal Market Economy Transition and the Unconventional Tools Used since 2010)*, Akadémiai Kiadó, Budapest, https://doi.org/10.1556/9789634540120

Mazzucato, M, Perez, C. (2014). Innovation as Growth Policy: the challenge for Europe (2014). *Working Paper Series,* SWPS'2014D13, https://doi.org/10.2139/ssrn.2742164

Minsky, H. (1992). The Financial Instability Hypothesis. The Jerome Levy Economic Institute of Bard College. *Working Paper No. 74*, May 1992

Mirdala, R., Kamenik, M. (2017). Effects of Fiscal Policy Shocks in CE3 Countries (TVAR

Approach). *E+M Economics and Management*, 20(2), pp. 46-64, https://doi.org/10.15240/tul/001/2017-2-004

Reifschneider, D., Wascher, W. L., Wilcox, D. W. (2015). Aggregate Supply in the United States: Recent Developments and Implications for the Conduct of Monetary Policy. *IMF Economic Review*, 63(1), pp. 71-109, https://doi.org/10.2139/ssrn.2376334

Reinhart, C. M., Rogoff, K. S. (2010). Growth in a Time of Debt. *American Economic Review*, 100(2), pp. 573-578, https://doi.org/10.3386/w15639

Schumpeter, J. A. (1934 (1912). The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle. *Harvard Economic Studies*. Cambridge, Mass.: Harvard University Press

Sedgley, N. H., Burger, J. D., Tan, K. M. (2018). The symmetry and cyclicality of R&D spending in advanced economies. *Empirical Economics*, 1-18, https://doi.org/10.1007/s00181-018-1508-6

Solow, R. (2012). Fiscal policy. In: Blanchard, O., Romer, D., Spence, M., Stiglitz, J. (2012): *In the Wake of the Crisis. Leading Economists Reassess Economic Policy.* The MIT Press, Cambridge, Massachusetts, pp. 73-78, https://doi.org/10.5089/9780262017619.071

Stiglitz, J. E. (1990). Symposium on bubbles. *The Journal of Economic Perspectives*, 4(2), pp. 13-18, https://doi.org/10.1257/jep.4.2.13

Stiglitz, J. E. (2012). Macroeconomics, Monetary Policy, and the Crisis In the Wake of the Crisis Leading Economists Reassess Economic Policy. *International Monetary Fund*, 2012, https://doi.org/10.7551/mitpress/9451.003.0007

Stiglitz, J. E. (2014). Reconstructing macroeconomic theory to manage economic policy. *NBER Working Paper,* No. 20517, https://doi.org/10.3386/w20517

Summers, L. H. (2013). Why stagnation might prove to be the new normal. *Financial Times*, December 15, 2013

Summers, L. H. (2014). U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound. *Business Economics*, 49(2), pp. 65-73, https://doi.org/10.1057/be.2014.13

Váry, M. (2019). A hiszterézis közgazdasági jelentőségéről posztkeynesi szemléletben. (On the Importance of Hysteresis from a Post-Keynesian Approach.) *Közgazdasági Szemle (Economic Review)*, 59(11), pp. 1006-1047, https://doi.org/10.18414/ksz.2018.10.1006

Verspagen, B. (2005). Innovation and Economic Growth. In Fagerberg, J., Mowery, D. C., Nelson, R. R. (eds.): *The Oxford Handbook of Innovation*. Oxford: Oxford University Press, https://doi.org/10.1093/oxfordhb/9780199286805.003.0018

Vörös, T. (2018). Methodological Challenges in Cost-Benefit Analysis. *Pénzügyi Szemle (Public Finance Quarterly)*, 2018/3, pp. 411-432

Whalen, C. J., Reichling, F. (2015). The Fiscal Multiplier and Economic Policy Analysis in the United States. *Contemporary Economic Policy*, 33(4), pp. 735-746, https://doi.org/10.1111/coep.12104

Online sources

Garcia-Macia, D. (2015). The Financing of Ideas and the Great Deviation Job Market Paper. Downloaded from: https://siepr.stanford.edu/sites/default/files/publications/16-012.pdf, downloaded on: 28.03.2019

Magyar Nemzeti Bank (2016). Növekedési jelentés, 2016. (Progress Report, 2016.) Downloaded from: https://www.mnb.hu/letoltes/novekedesi-jelentes-2016-hu.PDF, downloaded on: 28.03.2019

Rogoff, K. (2015). Debt supercycle, not secular stagnation, Vox.EU blog, April. Downloaded from: http://voxeu.org/article/debt-supercycle-not-secular-stagnation, downloaded on: 28.03.2019

Summers, L. H. (2016). The Age of Secular Stagnation. Downloaded from: http://larrysummers.com/2016/02/17/the-age-of-secular-stagnation/, downloaded on: 28.03.2019